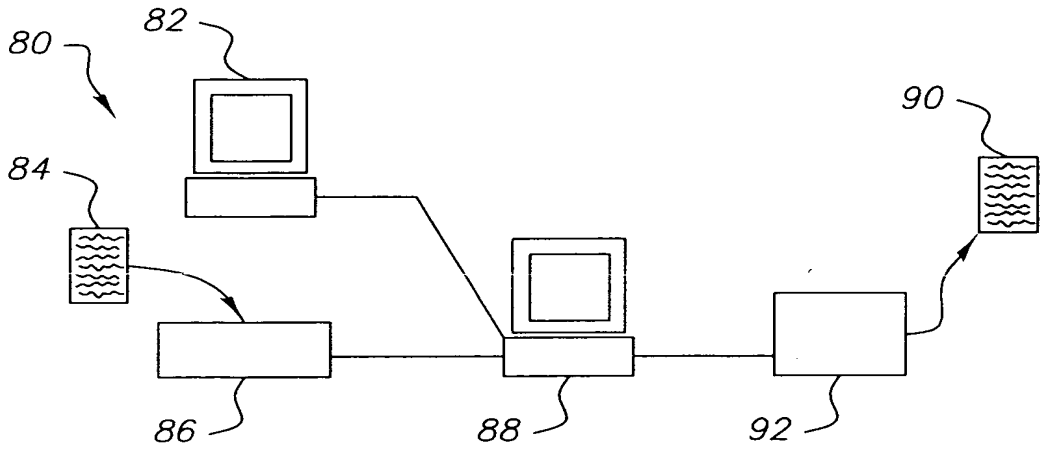

FIG. 1

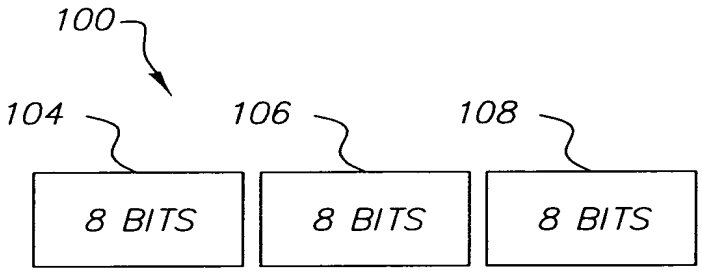

FIG. 3

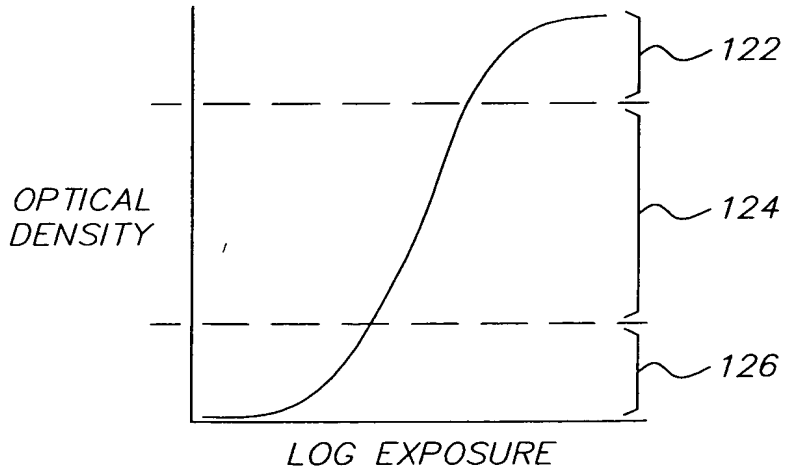

FIG. 4

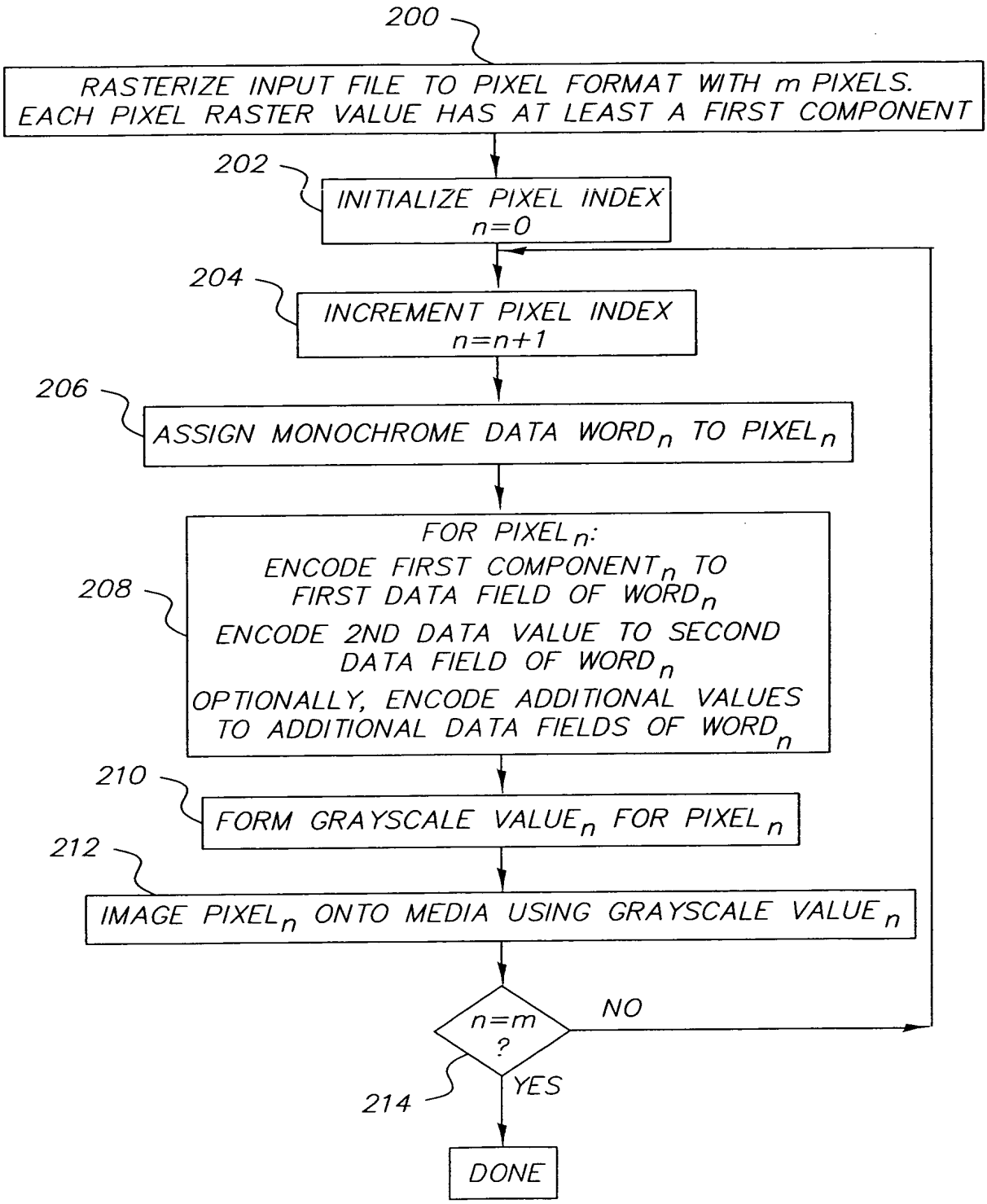

FIG. 2

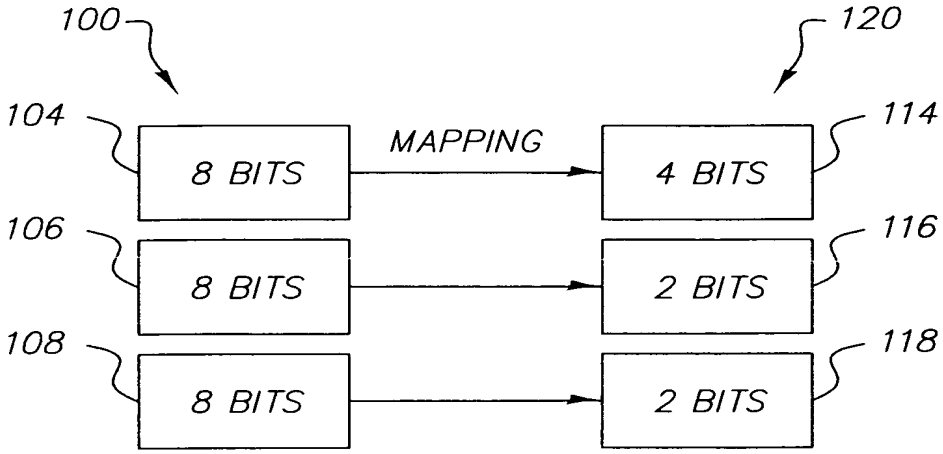

FIG. 5

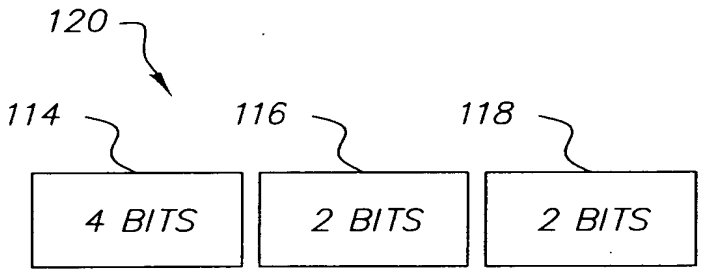

FIG. 6

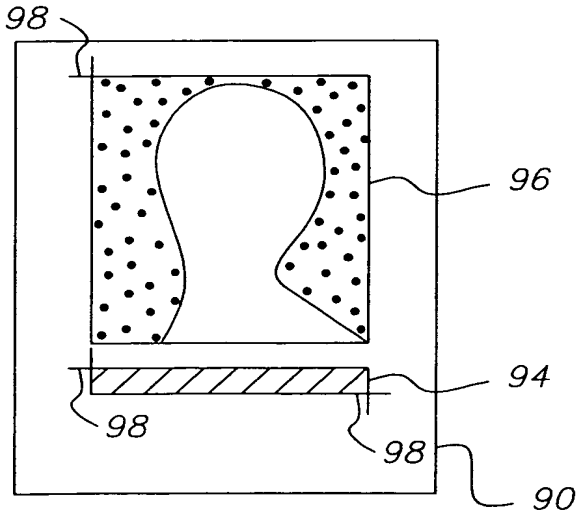

FIG. 7

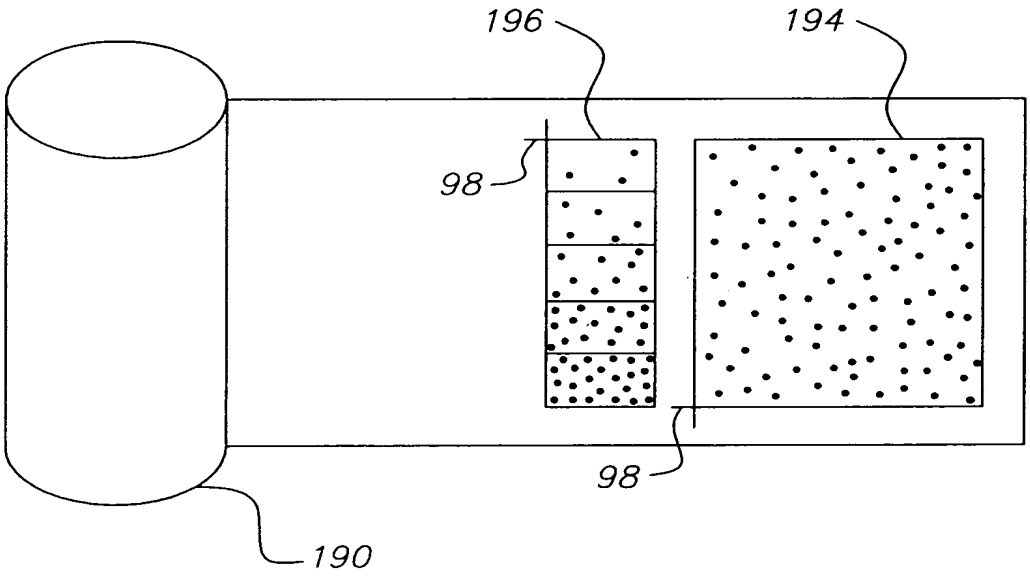

FIG. 8

```
<Color_Encoding_Metadata>
    <Preservation_Media>
        <Media_Read_Calibration>
            <Step_Wedge_Target_Location>
                <Frame_Number>5</Frame_Number>
                <Location_in_Frame>
                    <x>1 mm</x>
                    <y>1 mm</y>
                </Location_in_Frame>
            </Step_Wedge_Target_Location>
            <Step_Wedge>
                <Number_of_Density_Steps>3</Number_of_Density_Steps>
                <Density_Step ID="1">
                    <Density_Value>.10</Density_Value>
                    <Size>3 x 3 mm</Size>
                </Density_Step>
                <Density_Step ID="2">
                    <Density_Value>1.0</Density_Value>
                    <Size>3 x 3 mm</Size>
                </Density_Step>
                <Density_Step ID="3">
                    <Density_Value>2.0</Density_Value>
                    <Size>3 x 3 mm</Size>
                </Density_Step>
            </Step_Wedge>
        </Media_Read_Calibration>
        <Media_Write_Calibration>
            <Step_Wedge>
                <Number_of_Density_Steps>3</Number_of_Density_Steps>
                <Density_Step ID="1">
                    <Code_Value>0</Code_Value>
                </Density_Step>
                <Density_Step ID="2">
                    <Code_Value>128</Code_Value>
                </Density_Step>
                <Density_Step ID="3">
                    <Code_Value>255</Code_Value>
                </Density_Step>
            </Step_Wedge>
        </Media_Write_Calibration>
    </Preservation_Media>
    <Writer_Characteristics>
        <Spot_Size>
            <Dot_Pitch>3.3 microns</Dot_Pitch>
            <Dot_Width>6.0 microns</Dot_Width>
        </Spot_Size>
        <In_Track_DPI>8000</In_Track_DPI>
        <Cross_Track_Pitch>3.3 microns</Cross_Track_Pitch>
    </Writer_Characteristics>
</Color_Encoding_Metadata>
```

194

Fig. 9

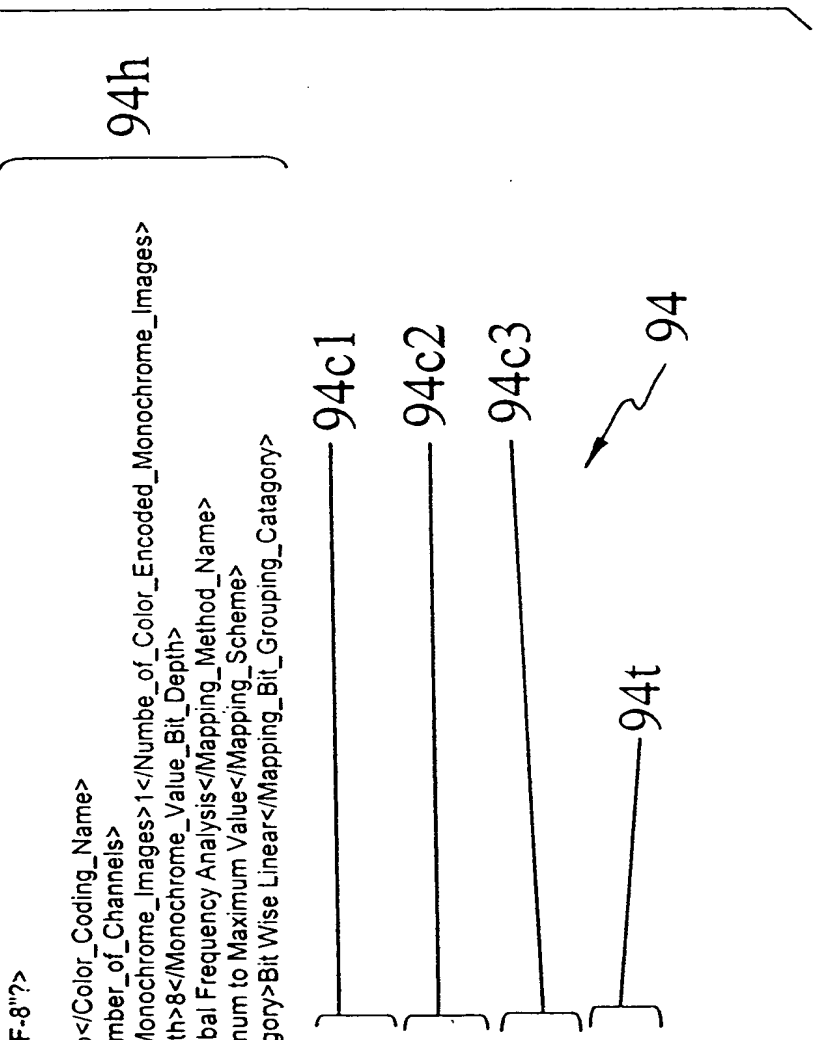
<?xml version="1.0" encoding="UTF-8"?>
<Image_Color_Encoding>
<Color_Coding_Name>CIELab</Color_Coding_Name>
<Number_of_Channels>3</Number_of_Channels>
<Numbe_of_Color_Encoded_Monochrome_Images>1</Numbe_of_Color_Encoded_Monochrome_Images>
<Monochrome_Value_Bit_Depth>8</Monochrome_Value_Bit_Depth>
<Mapping_Method_Name>Global Frequency Analysis</Mapping_Method_Name>
<Mapping_Scheme>Map Minimum to Maximum Value</Mapping_Scheme>
<Mapping_Bit_Grouping_Catagory>Bit Wise Linear</Mapping_Bit_Grouping_Catagory>
<Bit_Relation_Mapping>
<Color_Channel ID="1">
</Color_Channel>
<Color_Channel ID="2">
</Color_Channel>
<Color_Channel ID="3">
</Color_Channel>
</Bit_Relation_Mapping>
</Image_Color_Encoding>
94h
94c1
94c2
94c3
94
94t

Fig. 10a

```
<Color_Channel ID="1">
  <Name>Lightness (L)</Name>
  <Number_of_Bits>4</Number_of_Bits>
  <Monocrome_Bit_Position>7,6,5,4</Monocrome_Bit_Position>
  <Most_Significant_Bit>7</Most_Significant_Bit>
  <Image_Color_Channel_Value_Range>0 to 100</Image_Color_Channel_Value_Range>
  <Mapping_Definition>
      <Channel_Value min="0" max="5">
          <Encoded_Value>0</Encoded_Value>
          <Decode_Value>0</Decode_Value>
      </Channel_Value>
      <Channel_Value min="6" max="11">
          <Encoded_Value>1</Encoded_Value>
          <Decode_Value>6</Decode_Value>
      </Channel_Value>
      <Channel_Value min="12" max="17">
          <Encoded_Value>2</Encoded_Value>
          <Decode_Value>12</Decode_Value>
      </Channel_Value>
      <Channel_Value min="18" max="25">
          <Encoded_Value>3</Encoded_Value>
          <Decode_Value>18</Decode_Value>
      </Channel_Value>
      <Channel_Value min="26" max="31">
          <Encoded_Value>4</Encoded_Value>
          <Decode_Value>26</Decode_Value>
      </Channel_Value>
      <Channel_Value min="32" max="37">
          <Encoded_Value>5</Encoded_Value>
          <Decode_Value>32</Decode_Value>
      </Channel_Value>
      <Channel_Value min="38" max="43">
          <Encoded_Value>6</Encoded_Value>
          <Decode_Value>38</Decode_Value>
      </Channel_Value>
      <Channel_Value min="44" max="51">
...
      <Channel_Value min="52" max="57">
...
      <Channel_Value min="58" max="63">
...
      <Channel_Value min="64" max="69">
...
      <Channel_Value min="70" max="77">
...
      <Channel_Value min="78" max="81">
          <Encoded_Value>12</Encoded_Value>
          <Decode_Value>81</Decode_Value>
      </Channel_Value>
      <Channel_Value min="82" max="88">
          <Encoded_Value>13</Encoded_Value>
          <Decode_Value>88</Decode_Value>
      </Channel_Value>
      <Channel_Value min="89" max="94">
          <Encoded_Value>14</Encoded_Value>
          <Decode_Value>94</Decode_Value>
      </Channel_Value>
      <Channel_Value min="95" max="100">
          <Encoded_Value>15</Encoded_Value>
          <Decode_Value>100</Decode_Value>
      </Channel_Value>
  </Mapping_Definition>
</Color_Channel>
```

94c1

Fig. 10b

```
<Color_Channel ID="2">
    <Name>Chroma (a)</Name>
    <Number_of_Bits>2</Number_of_Bits>
    <Monocrome_Bit_Position>3,2</Monocrome_Bit_Position>
    <Most_Significant_Bit>3</Most_Significant_Bit>
    <Image_Color_Channel_Value_Range>113 to 195</Image_Color_Channel_Value_Range>
    <!--Image Color Channel Range 113 to 195 maps to CIELab a* range -14 to 68 -->
    <Mapping_Definition>
        <Channel_Value min="113" max="132">
            <Encoded_Value>0</Encoded_Value>
            <Decode_Value>113</Decode_Value>
        </Channel_Value>
        <Channel_Value min="133" max="153">
            <Encoded_Value>1</Encoded_Value>
            <Decode_Value>133</Decode_Value>
        </Channel_Value>
        <Channel_Value min="154" max="174">
            <Encoded_Value>2</Encoded_Value>
            <Decode_Value>174</Decode_Value>
        </Channel_Value>
        <Channel_Value min="175" max="195">
            <Encoded_Value>3</Encoded_Value>
            <Decode_Value>195</Decode_Value>
        </Channel_Value>
    </Mapping_Definition>
</Color_Channel>
```

94c2

Fig. 10c

```
<Color_Channel ID="3">
    <Name>Chroma (b)</Name>
    <Number_of_Bits>2</Number_of_Bits>
    <Monocrome_Bit_Position>1,0</Monocrome_Bit_Position>
    <Most_Significant_Bit>1</Most_Significant_Bit>
    <Image_Color_Channel_Value_Range>107 to 210</Image_Color_Channel_Value_Range>
    <!--Image Color Channel Range 107 to 210 maps to CIELab b* range -20 to 83 -->
    <Mapping_Definition>
        <Channel_Value min="107" max="132">
            <Encoded_Value>0</Encoded_Value>
            <Decode_Value>107</Decode_Value>
        </Channel_Value>
        <Channel_Value min="133" max="158">
            <Encoded_Value>1</Encoded_Value>
            <Decode_Value>133</Decode_Value>
        </Channel_Value>
        <Channel_Value min="159" max="184">
            <Encoded_Value>2</Encoded_Value>
            <Decode_Value>184</Decode_Value>
        </Channel_Value>
        <Channel_Value min="185" max="210">
            <Encoded_Value>3</Encoded_Value>
            <Decode_Value>210</Decode_Value>
        </Channel_Value>
    </Mapping_Definition>
</Color_Channel>
```

94c3

Fig. 10d

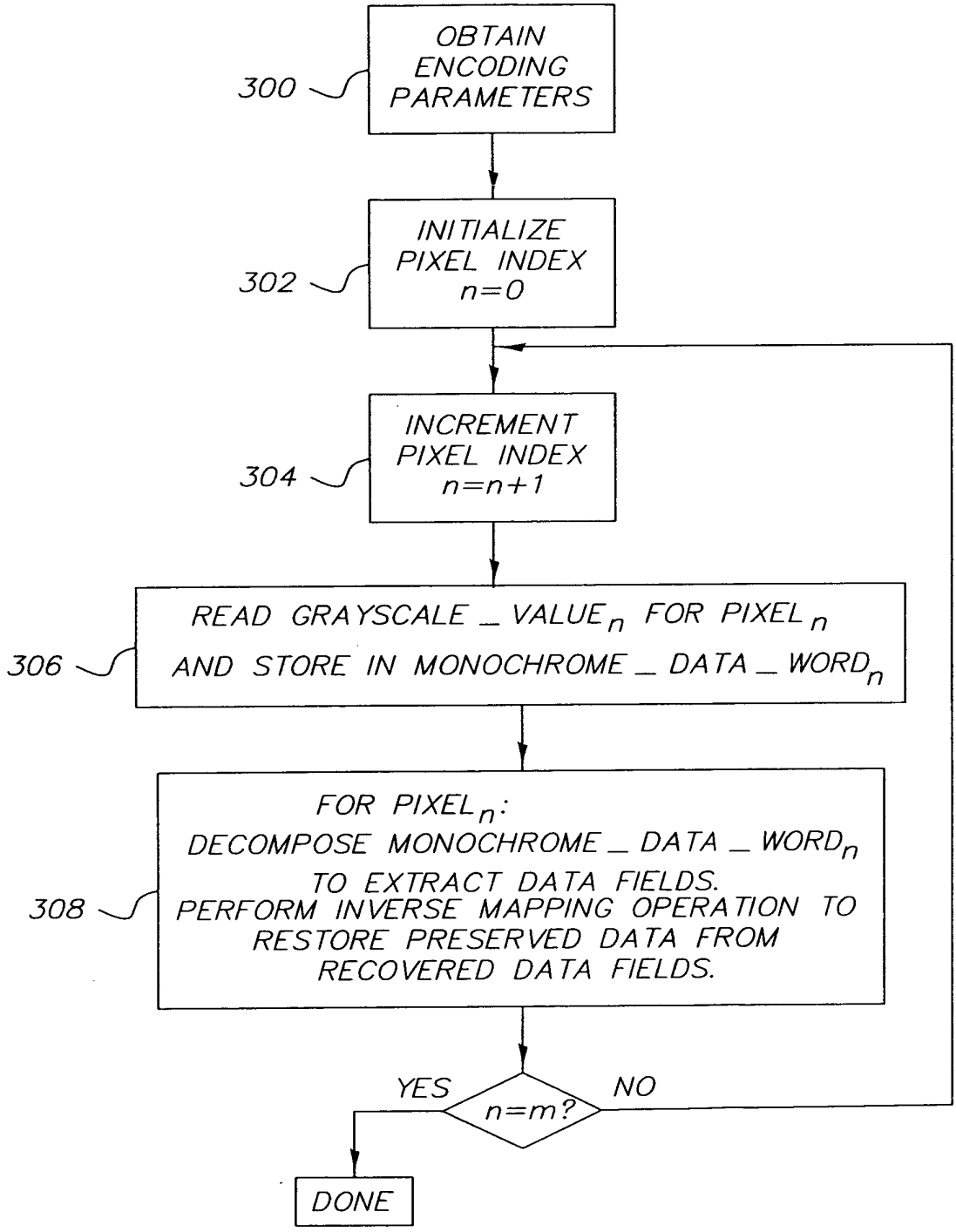
300
OBTAIN ENCODING PARAMETERS
302
INITIALIZE PIXEL INDEX n=0
304
INCREMENT PIXEL INDEX n=n+1
306
READ GRAYSCALE_VALUE$_n$ FOR PIXEL$_n$ AND STORE IN MONOCHROME_DATA_WORD$_n$
308
FOR PIXEL$_n$: DECOMPOSE MONOCHROME_DATA_WORD$_n$ TO EXTRACT DATA FIELDS. PERFORM INVERSE MAPPING OPERATION TO RESTORE PRESERVED DATA FROM RECOVERED DATA FIELDS.
YES
n=m?
NO
DONE

FIG. 11

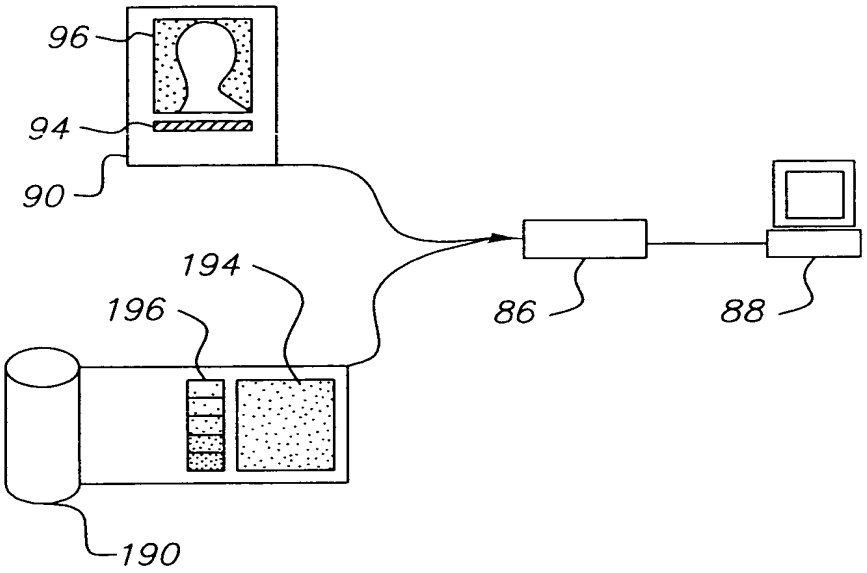
96
94
90
194
196
86
88
190

FIG. 12

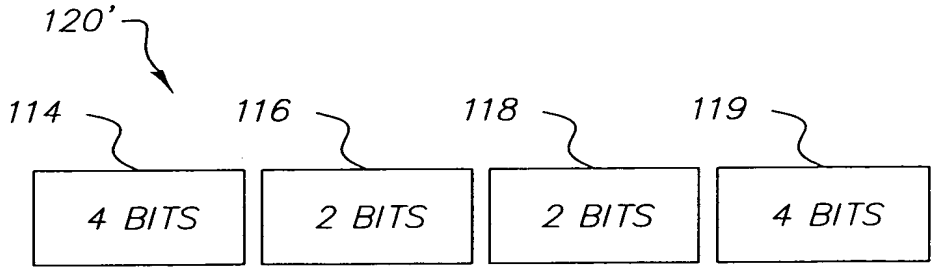
120'
114
116
118
119
4 BITS
2 BITS
2 BITS
4 BITS

FIG. 13